GGS LEADER DISCUSSION
ON 2012 BUDGET
AUGUST 29, 2011

1) THREATS TO O&M BUDGET

a) Utility Boiler MACT Rule – Preliminary Engineering Work
   i) New GGS1 & GGS2 Particulate CEMS (2012) – Est. $50K for preliminary NPPD / 3rd party engineering consultant work
   ii) New GGS1 & GGS2 HCL CEMS (2012) Est. $50K for preliminary NPPD / 3rd party engineering consultant work
   iii) Install ACI on GGS1 & GGS2 for Mercury Control (2012) - Est. $75K for preliminary NPPD / 3rd party engineering consultant work

b) CSAPR
   i) NOx Reduction
      (1) SNCR Installation Required on either GGS1 or GGS2 or both (2012 Preliminary Engineering and Testing Work)
         (a) GGS Unit 1 and 2 Emission Species / Temperature Mapping
            (i) $225K Fuel Tech Costs
            (ii) $30K GGS personnel and material costs

         (b) SNCR Trial Testing on GGS1 or GGS2 or both (2012)
            (i) $900K ($450K per unit) Fuel Tech cost for temporary SNCR System testing on each GGS unit (3-month minimum including setup and teardown). Urea reagent costs not included.
            (ii) $100K GGS personnel and material costs

         (c) Engineering for Permanent System
            (i) $100K – 200K GGS personnel and material costs

      (2) SNCR Reagent Costs (2012 only)
         (a) Unit 1 – $1.56 million based on high load 90 day test case of (390 gph x 2160 operating hours x $1.85/gal) with a starting NOx level of 0.2 lbs / mmBtu
         (b) Unit 2 – $2.55 million based on high load case of (639 gph x 2160 operating hours x $1.85/gal) with a starting NOx level of 0.36 lbs / mmBtu

   ii) SOx Reduction
      (1) DSI Installation Required on either GGS1 or GGS2 or both
         (a) Preliminary Engineering Work (To be performed in 2012)
            (i) $225K DSI Costs
            (ii) $30K GGS personnel and material costs
         (b) DSI Reagent Costs – Estimate $5 – 10 million / year / unit

c) EPA Regulatory Issue Investigative Work
   i) Perform preliminary engineering investigation of station impact due to proposed new EPA rules and regulations. - $100K

d) GGS1 & GGS2 Coal Silo Degradation Issues
   i) GGS1 & GGS2 Silo Inspections for Jenike & Johanson – ($100K) – 2012
   ii) Temporary Repairs to Silos (Unknown at this time)

e) Asiatic Clams
   i) Fire Protection Treatment
      (1) Spring / Summer Treatment - $50K per treatment

   ii) Circulating Water Treatment - (Unknown at this time)

f) GGS1 & GGS2 Burner / OFA Inspections for CSAPR Annual Inspection
   i) Perform visual inspections and tuning of the combustion process on each unit to optimize combustion. May involve unit performance testing. - (Estimate $100K / year per unit. Note: Estimate $50K – 70K per unit to have a full blown boiler performance test completed)

g) GGS Fly Ash Silo Unloading Dust Control Issues
   i) Install additional equipment to control dust levels during fly ash unloading operations at the GGS silos. Unknown at this time)

2) THREATS TO CAPITAL BUDGET

a) Coal Yard Maintenance Building
   i) Will likely only be able to complete preliminary engineering in 2012. Actual field work will have to take place in 2013.

b) Regional Haze FIP
   i) Possibly required SCR and / or FGD on one or both units

c) MPCE Preliminary Equipment Preparation
   i) Installation of Unit 2 ESP Bypass
   ii) Installation of Redundant 230 kV feed
   iii) GGS Unit 1 and 2 Economizer Ash Handling System replacement

d) Utility Boiler MACT Rule
   i) New GGS1 & GGS2 Particulate CEMS (2015 Field Implementation & Startup)
   ii) New GGS1 & GGS2 HCL CEMS (2015 Field Implementation & Startup)
   iii) Install ACI on GGS1 & GGS2 for Mercury Control (2015 Field Implementation & Startup)

e) CSAPR

i) NOx Reduction
   (1) SNCR Installation Required on either GGS1 or GGS2 or both (2012 / 2013 Field Implementation & Startup)

ii) SOx Reduction
   (1) DSI Installation Required on either GGS1 or GGS2 or both (2013 Field Implementation & Startup)

f) GGS1 & GGS2 Coal Silo Degradation Issues
   i) Make modifications to existing coal silos to maintain structural stability (Field implementation for 2012 possibly)

g) GGS1 Waterwall Replacement
   i) Replace selected sections of the GGS1 side and front waterwalls. – Estimate $6 – 8 million, 2012 Budget / 2013 Installation

h) Wastewater Recovery Tank Level Indication and Raw Water Makeup
   i) Install level indication on the Ash Water Surge Tank and add raw water makeup capability to the Wastewater Recovery System – Estimate $220K